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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/595,841	05/15/2006	Warren Thomas Johnson	2003P87067WOUS	7643

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SIEMENS CORPORATION
INTELLECTUAL PROPERTY DEPARTMENT
170 WOOD AVENUE SOUTH
ISELIN, NJ 08830

EXAMINER	
ANDERSON, DENISE R	

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1797	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/595,841	JOHNSON, WARREN THOMAS	
	Examiner	Art Unit	
	Denise R. Anderson	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) *23-33* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-33* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 May 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/24/2007 and 12/05/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction is required under 35 U.S.C. 121 and 372. This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-22, drawn to an aeration/backwash apparatus for a membrane module.

Group II, claim(s) 23-33, drawn to a method to clean a membrane module using the aeration/backwash apparatus.

2. The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The special technical feature is the aeration/backwash apparatus recited in claim 1. Zha et al. (WO 98/28066, Jul. 2, 1998) discloses such an apparatus. In the Abstract, lines 1-3, Zha et al. teaches, "A method and apparatus for removing fouling materials from the surface of a plurality of porous membranes (9) arranged in a membrane module (4)." In Figures 1 and 7, Zha et al. shows membranes (fibres 9) extending vertically between upper and lower headers (upper and lower potting heads 6 and 7) with a communication chamber (plenum chamber 17). Regarding the plenum chamber 17, Zha et al. discloses, "[A]ir may be fed into a plenum chamber 17 below the aeration holes 10 by an air supply tube

running from above the feed tank to the bottom of the membrane module. This tube may run down the centre of the membrane module or down the outside. The plenum chamber 17 may also be connected to or form a part of a lower manifold 18 which may be used alternately for supply of aeration gas or as a liquid manifold for removal of concentrated backwash liquid from the tank during draindown or backwashing from the bottom of the module." Zha et al., Page 10, line 23 to Page 11, line 2. In other words, Zha et al. teaches a communication chamber with openings through which gas is supplied or liquid backwash is withdrawn. As such, Zha et al. teaches the aeration/backwash apparatus that is the special technical feature. Thus, the claims do not recite a special technical feature that makes a contribution over the prior art and, because of this, there is a lack of unity of invention under PCT Rule 13.1.

3. The examiner has required restriction between product and process claims. Where applicant elects claims directed to the product, and the product claims are subsequently found allowable, withdrawn process claims that depend from or otherwise require all the limitations of the allowable product claim will be considered for rejoinder. All claims directed to a nonelected process invention must require all the limitations of an allowable product claim for that process invention to be rejoined.

4. In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the

requirements of 35 U.S.C. 101, 102, 103 and 112. Until all claims to the elected product are found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowable product claim will not be rejoined. See MPEP § 821.04(b). Additionally, in order to retain the right to rejoinder in accordance with the above policy, applicant is advised that the process claims should be amended during prosecution to require the limitations of the product claims. **Failure to do so may result in a loss of the right to rejoinder**. Further, note that the prohibition against double patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.

5. During a telephone conversation with Pasquale Musacchio on July 1, 2008 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-22. Affirmation of this election must be made by applicant in replying to this Office action. Claims 23-33 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

6. **Applicant is advised that the reply to this requirement to be complete must include (i) an election of a invention to be examined** even though the requirement may be traversed (37 CFR 1.143) **and (ii) identification of the claims encompassing the elected invention.**

7. The election of an invention may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election

shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected invention.

8. Should applicant traverse on the ground that the inventions are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-12, 14, and 17-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Cote el. (US Patent No. 5,607,593, Mar. 4, 1997).

11. Regarding claim 1, Cote et al. discloses aeration / backwash devices in a water-treatment installation with one or more membranes (membranes 3) vertically spaced between upper and lower headers. Cote et al., Abstract, line 1; Figures 1, 3, 5-8 and 10

showing membranes 3. There are two types of Cote et al. aeration / backwash devices. First, there is a wall 9 through which air from the air compressor 19 or permeate from backwashing pump 18, or both, are delivered from permeate recovery chamber 10 into the membrane modules 3 via the openings in the hollow fibers housed in sheaths 5. Cote et al., Figures 1 and 8-7; Column 10, lines 1-19. In this case, applicant's aeration / backwash devices would be the Cote et al. hollow fibers with the recited communication chamber being the hollow center of the hollow fibers and the recited through-openings that gas and liquid pass through being the hollow fiber pores.

12. The one remaining claim 1 limitation is taught by the second type of Cote et al. aeration / backwash device. Cote et al. discloses such devices in Figures 1-2 and 5-11 as ozone (or O3) injection means 6 connected to an ozone supply network 15 "to serve as both a circulation fluid and an oxidizing fluid." Cote et al., Column 3, lines 27-28. Cote et al. further teaches, "The ozone could therefore be introduced into the installation according to the following three modes of implementation: in a gaseous monophase form . . . in a biphase form . . . in an aqueous monophase form." Cote et al., Column 4, lines 33-44; Figure 1 where the ozone is introduced as a gas, Figure 7 where the ozone is introduced as a gas with water, and Figure 8 where the ozone is introduced in saturated water form. Cote et al. further discloses three embodiments of the ozone injection means that correspond to the recited aeration/backwash device with a communication chamber and spaced-through holes for the introduction of gas or liquid. First, there is the tube shown in Figure 6 where the ozone (O3) is introduced by ozone injection means 6. Second, there is the annular structure shown in Figure 9 at the

bottom of the membrane module 31 where the chamber is underneath the hood, with the small through-holes shown at the ends of the ozone supply means 15 and the large through holes shown as lower open-worked zone 8. Third, there is porous structure 16 through which ozone (O3) is introduced as shown in Figure 10. The second embodiment shown in Figure 9 is an example of applicant's recited "aeration/backwash device [that] is adapted to at least partially surround a portion of said membrane module."

13. To summarize, Cote et al. anticipates all claim 1 limitations.

14. As an aside, it does not enter into the patentability analysis whether the liquid backwash provided to the aeration / backwash device is permeate or water to be treated because it has been held that, "Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969). MPEP 2115 [R-2]. As long as Cotes et al. discloses an apparatus structure to deliver a gas or a liquid through the through-openings of the aeration/ backwash device, the prior art reads on the claim limitation. In this case, Cotes et al. discloses that both gas and liquid can be delivered to the through-openings in the hollow fiber aeration / backwash device and the ozone injection aeration / backwash devices.

15. Regarding claim 2, Cote et al. discloses an aeration/backwash device wherein the gas and liquid backwash are selectively communicated through the same through-

openings. In other words, gas and liquid can be introduced "selectively" in time where gas is introduced first and then liquid or vice versa. For hollow fiber aeration / backwash devices, Cote et al. teaches, "The backwashing . . . starts with the permeate present in the chamber 10 . . . and ends by the penetration of air . . . at the end of the backwashing operation." Cote et al., Column 10, lines 9-19; Figures 1 and 7-8. For the ozone injection aeration / backwash devices, Cote et al. shows equipment set up to deliver a gas stream through ozone-supply means 22 and an air compressor 19 and liquid through pump 21a in Figures 7 and 8, such that gas and liquid can be introduced selectively to ozone injection means 6.

16. Regarding claims 3-4, claim 3 recites the through-openings are vertically spaced and gas moves "through at least the upper of said through-openings" and liquid "is withdrawn . . . through the lower of said through-openings." Claim 4 recites liquid is fed "into the base of the module through the lower openings or both sets of openings." As was discussed in the claim 1 patentability analysis, Cote et al. discloses the apparatus in place to deliver gas and liquid to the hollow fiber aeration / backwash devices (Figures 1, 7, and 8) and the ozone injection aeration / backwash devices in (Figures 7 and 8). Cote et al. further teaches that the hollow fiber aeration / backwash devices have vertically spaced through-openings in the form of pores such that gas moves "through at least the upper of said through-openings" and liquid "is withdrawn . . . through the lower of the through-openings," as recited in claim 3. Cote et al. further teaches, in Figures 1 and 7-8, that liquid is fed "into the base of the module through the lower openings or both sets of openings" as recited in claim 4. Cote et al. also

discloses vertically spaced through openings in the ozone-injection aeration / backwash device shown in Figure 9 with small through-holes shown at the ends of the ozone supply means 15 and the large through-holes shown as lower open-worked zones. In Figure 9, Cote et al. further teaches bubbles 11 and liquid moving "through at least the upper of said through-openings." As was discussed in the claim 1 patentability analysis, Cote et al. also teaches that ozone can be injected as a liquid (Figure 8 and Column 4, lines 33-34 and 42) through the ozone network supply means 15 shown in Figure 9. As such, Cote et al. discloses that liquid is fed "into the base of the module through the lower openings or both sets of openings" as recited in claim 4.

17. Regarding claim 5, Cote et al. discloses an apparatus in place such that "ozone injection means (applicant's aeration / backwash device) enabl[es] the creation of a current of water within said sheath" and thus discloses a device that can inject liquid "to sweep solids along membranes . . . during aeration" as recited.

18. Regarding claims 6-10, Cote et al. discloses an ozone injection aeration / backwash device in Figure 9 at the bottom of the membrane module 31 and also hollow fiber aeration / backwash devices (fibers enclosed in membrane module 31) with the through-openings being the hollow fiber pores. Both types of devices were discussed in the claim 1 patentability analysis above. As was also discussed in the claim 1 patentability analysis, Cote et al. further teaches that both gas and liquid flow through these devices in Figures 1 and 7-8. The Cote et al. ozone injection device in Figure 9 has small through-holes shown at the ends of the ozone supply means 15 and large through holes shown as lower open-worked zone 8. As such, Cote et al. discloses

upper and lower through-openings [claim 6] through which liquid flows [claim 9]. The upper through-openings, i.e., the pores, of the hollow fiber devices are smaller than the lower through-openings of the ozone injection device [claim 7]. Cote et al. also discloses, in the Figure 9 ozone injection device, through-openings axially displaced around the periphery of the chamber [claim 8] in the form of an annulus [claim 10].

19. To summarize, Cote et al. anticipates all limitations recited in claims 2-10.

20. Independent claim 11 recites claim 1 limitations in a different format. As such, the patentability analyses are analogous. Claim 11 further recites an upper and lower filtrate collection chamber. Cotes et al. discloses an upper filtrate chamber in Figures 10 and 11 and a lower filtrate collection chamber (permeate-recovery chamber 10) in Figures 1 and 6-8.

21. To summarize, Cote et al. anticipates claim 11.

22. Dependent claim 12 recites claim 3 limitations and, as such, the patentability analyses are analogous. To summarize Cote et al. anticipates claim 12.

23. Dependent claim 14 recites that the aeration / backwash device is adjacent the lower header. Cote et al. discloses this for the hollow fiber aeration / backwash devices (membranes 3) in Figures 5-6 and 9-11. Cote et al. further teaches this for the ozone injection aeration / backwash devices shown in Figure 6 (the tube where the ozone, O3, is introduced by ozone injection means 6), in Figure 9 (the annular structure at the bottom of the membrane module 31 where the ozone, O3, is introduced through ozone

supply means 15) and Figure 10 (the porous structure 16 where ozone, O3, is introduced).

24. Dependent claims 17-22 recite various limitations on a screen surrounding the membranes. In Figures 1-11, Cote et al. discloses a screen (sheath 5) at least partially surrounding the membranes [claim 17] (membranes 3) and at least partially extending along the membrane length [claim 18] in a membrane filtration module (filtration module 31). The Cote et al. screen (sheath 5) is solid [claim 19] and located above the ozone injection backwash / aeration devices [claim 20] as shown in Figure 6 (the tube where the ozone, O3, is introduced by ozone injection means 6), in Figure 9 (the annular structure at the bottom of the membrane module 31 where the ozone, O3, is introduced through ozone supply means 15) and in Figure 10 (the porous structure 16 where ozone, O3, is introduced). In these same figures, Cote et al. further teaches that the screen (sheath 5) extends the full length of the membrane module (membranes 3 in filtration module 31) with one or more openings (open-worked zones 8) adjacent the aeration / backwash device and additional openings (open-worked zones 8) at the top [claim 21]. Cote et al. also teaches that liquid moves through the screen openings [claim 22], i.e. the sheath holes, when Cote et al. discloses that "said sheaths hav[e] holes that enable the passage of water to be treated in said preferred direction of treatment." Cote et al., Column 3, lines 60-62.

25. To summarize, Cote et al. anticipates all limitations recited in dependent claims 12, 14, and 17-22.

Claim Rejections - 35 USC § 103

26. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

27. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

28. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cote el. (US Patent No. 5,607,593, Mar. 4, 1997) as applied to claim 11 above, and further in view of Zha et al., (WO 03/013706 A1, Feb. 20, 2003 – which will be cited from the equivalent US Patent Pub. 2004/0217053 A1).

29. Claim 13 recites a filtrate collection pipe between the upper and lower filtrate collection chambers. Cote et al. discloses the claimed invention except for the filtrate collection pipe. In the Figure 1 membrane module assembly, Zha et al. teaches that it is known to have a filtrate collection pipe between upper and lower filtrate collection chambers (permeate collection headers 9 and 10). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have included a filtrate collection pipe between the Cote et al. upper and lower filtrate collection

chambers as taught by Zha et al., since Zha et al. states at ¶ 30, lines 8-10, that such a modification would allow "(f)iltrate / permeate [to be] removed from both ends of the module 6 through ports 11 and 12 connected to headers 9 and 10 respectively," as opposed to just one end.

30. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cote el. (US Patent No. 5,607,593, Mar. 4, 1997) as applied to claim 11 above, in further view of Watanabe et al. (WO 02/04101 A1, Jan. 17, 2002 – which will be cited from the equivalent US Patent Pub. 2004/0045893 A1).

31. Cote et al. discloses the claimed invention except for explicitly stating that the filtration module is detachable [claim 15] from the upper and lower collection chambers. Watanabe et al. teaches that the filtration module is detachable in Figures 1, 4, 6 and 9-11 for "a hollow fiber membrane cartridge used in a filtration apparatus used for removing turbidity and bacteria from a large volume of raw water." Watanabe et al., ¶ 1, lines 6-8. Referring to Figure 6, Watanabe et al. further teaches, "The hollow fiber membrane cartridge of the present invention is inserted into the housing from above and fixed to the upper end of the housing head by means of the collar 12a of the cartridge through a gasket or an O-ring so as not to permit the passage of liquid either in or out. . . . The housing head 21b, the collar 12a and the cap 24 are integrally fixed by means of a housing nut 23." Watanabe et al., ¶ 98. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have constructed the Cote et al. filtration module to be detachable as taught by Watanabe et al., since Watanabe et al. states at ¶ 98 that such a modification would allow the hollow

fiber membrane cartridge to be inserted into the housing (applicant's screen) and then detachably secured there by a fitting so that the liquid to be filtered would not bypass the membranes.

32. Cote et al., in view of Watanabe et al., discloses the claimed invention except for the bayonet-type fitting recited in claim 16. The Watanabe et al. fitting is shown in Figure 9 as a clamp 20 and in Figures 10-11 as a threaded housing nut 23. It would have been obvious to one having ordinary skill in the art at the time the invention was made, in the Cote et al. filtration module, to have substituted a bayonet-type fitting for the clamp or threaded housing nut taught by Watanabe et al. because of the equivalence for their use in the fittings art – and the selection of any of these known equivalents to allow the hollow fiber membrane cartridge to first be inserted into the housing (applicant's screen) and then detachably secured there by a fitting so that the liquid to be filtered does not bypass the membranes, would be within the level of ordinary skill in the art.

Conclusion

33. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. These references contain some limitations recited for the aeration / backwash device. The Japanese reference discloses the recited screen enclosing the membranes.

Document ID	Date	Classification	Inventor
US 4539940 A	09/10/1985	122/32	Young; Richard K.
US 5203405 A	04/20/1993	165/160	Gentry; Cecil C. et al.
US 6071404 A	06/06/2000	210/232	Tsui; Tommy

US 20030075495 A1	04/24/2003	210/321.88	Dannstrom, Henrik et al.
JP2003047830	02/18/2003	B01D65/02	Murakami; Naoki et al.

34. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Denise R. Anderson whose telephone number is (571)270-3166. The examiner can normally be reached on Monday through Thursday, from 8:00 am to 6:00 pm.

35. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter D. Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

36. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DRA

/Walter D. Griffin/
Supervisory Patent Examiner, Art Unit 1797